

State of the science: Eye movement desensitization and reprocessing (EMDR) therapy

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Abstract

Eye movement desensitization and reprocessing (EMDR) therapy is an evidence-based psychotherapy for posttraumatic stress disorder (PTSD), with support from more than 30 published randomized controlled trials (RCTs) demonstrating its effectiveness in both adults and children. Most international clinical practice guidelines recommend EMDR therapy as a first-line treatment for PTSD. This paper describes the current state of the evidence for EMDR therapy. We begin with a brief description of EMDR therapy and its theoretical framework. Next, we summarize the scientific support for its efficacy, effectiveness, and safety and discuss its applicability across cultures and with diverse populations. We conclude with suggestions for future directions to develop the research base and applications of EMDR therapy.

Eye movement desensitization and reprocessing (EMDR) therapy is one of a handful of psychological treatments for posttraumatic stress disorder (PTSD) with substantial empirical support. As such, most of the international clinical practice guidelines for PTSD recommend EMDR as a first-line treatment, including those published by the World Health Organization (WHO; 2013), the National Institute for Health and Clinical Excellence (NICE; 2018), the International Society of Traumatic Stress Studies (ISTSS; 2018), and the U.S Department of Veterans Affairs (VA) and Department of Defense (DoD; 2023).

EMDR was devised by Francine Shapiro, a U.S.-based psychologist who in 1989 described the core procedure under the name “eye movement desensitization” (EMD;

Shapiro, 1989a). In the same year, Shapiro published the first controlled study on this procedure in the *Journal of Traumatic Stress* (1989b). For this, she treated 22 patients with persisting traumatic memories of childhood sexual abuse, physical and sexual assaults, emotional abuse, and experiences from the Vietnam War using a single session of EMD and found dramatic improvements that were maintained at 3-month follow-up (Shapiro, 1989b). In the years that followed, she elaborated and refined the EMD procedure into EMDR, adding resource-building, phases of assessment, reprocessing of cognitions, and closure to the protocol. EMDR, as it is practiced today, has evolved further into a comprehensive, manualized treatment approach, with adaptations to the protocol flexibly

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added for various forms of psychopathology and treatment obstacles (Valiente-Gomez et al., 2017) as well as for specific populations, such as children, adolescents (e.g., de Roos et al., 2017), and individuals with intellectual disabilities (e.g., Mevissen et al., 2020).

EMDR has several characteristics that distinguish it from most other psychological treatment methods for PTSD. For example, although it can be flexibly delivered in the context of a strong therapeutic alliance, EMDR is also highly protocolized in that the treatment procedure is taught to be delivered in exactly the same way worldwide, thus increasing the ability to disseminate the treatment and test its effectiveness through scientific research. Like other trauma-focused therapies, EMDR involves revisiting traumatic memories and their associated meanings, emotions, and bodily sensations. Unlike cognitive behavioral therapy (CBT) with a trauma focus, EMDR does not involve direct challenging of beliefs, extended exposure, or homework (Shapiro, 2018). Another striking difference is that relatively little verbal instruction is needed during the implementation of the protocol, and the therapist does not make explicit efforts to encourage the patient to verbalize their trauma memories.

The most distinctive component of EMDR is that the patient is typically asked to visually track the therapist's hand as it moves left and right while simultaneously holding their trauma memories in mind. Based on her initial observations and the clinical outcomes of utilizing her EMD technique, Shapiro came to believe that performing lateral eye movements initiated a processing mechanism in the patient that reduced emotional distress associated with the memories. To induce eye movements, EMDR therapists typically use their own hand and ask the patient to focus their attention on it. Next, they move their hand back and forth approximately 30 cm in front of the patient's face, facilitating a series (i.e., set) of approximately 25 saccadic eye movements. This variant of bilateral stimulation in EMDR is still the most well-known, and its efficacy has been extensively studied.

Initially, critics argued that EMDR did not demonstrate efficacy above and beyond nonspecific treatment effects and that there was insufficient evidence that the eye movements, which are so central to EMDR that they are part of its name, contributed significantly to the treatment's effectiveness (e.g., Herbert et al., 2000). Support for the differential effectiveness of EMDR with and without eye movements came more than 20 years after the first published outcome studies through both laboratory and dismantling studies (Günter & Bodner, 2008; Lee & Cuijpers, 2013; van den Hout & Engelhard, 2012). Several scientists in the field of neurobiology and experimental psychopathology have since developed theories to account for the distinctive effects of EMDR (e.g., Baek et al., 2019;

Günter & Bodner, 2008; van den Hout & Engelhard, 2012; de Voogd et al., 2018; de Voogd & Phelps, 2020).

The purpose of the present paper is to provide a general overview of the state of the science of EMDR for the treatment of PTSD. After describing the treatment paradigm and procedure, we discuss the conceptual and theoretical foundations of EMDR, including research on its most likely mechanisms of action. We then explore the empirical basis of EMDR for the treatment of PTSD in adults. We also summarize the existing evidence base for the application of EMDR cross-culturally and to marginalized communities. Finally, we present recommendations for future research and upcoming developments in the field of EMDR in relation to PTSD.

EMDR STANDARD PROTOCOL

Research has demonstrated a direct association between proper implementation of the so-called "EMDR standard protocol" and therapeutic outcomes; thus, strict adherence to the protocol is considered crucial to ensuring the robustness and empirical effectiveness of EMDR (Maxfield & Hyer, 2002). This protocol consists of eight fixed procedural steps (i.e., phases) comprising a series of standard questions and formulations. The steps involved are listed in Table 1.

The goal of the EMDR procedure can be described in terms of achieving a final state in which the disturbance related to the target memory is minimized and the credibility of a desired positive and self-referent belief related to the target memory is maximized. Within the framework of EMDR, the therapist is seen as a facilitator who helps the patient to optimally activate their trauma memories and guides them to focus on various components of a memory while simultaneously tracking the therapist's hand movements with their eyes.

After collecting information about the patient's symptoms and history, establishing a diagnosis, and formulating a case conceptualization of which memories are considered crucial targets for the treatment of the patient's PTSD symptoms (Phase 1), the patient is prepared for trauma processing (Phase 2). This includes building a therapeutic alliance, providing appropriate psychoeducation, and addressing the patient's existing coping skills. Before the desensitization process starts (i.e., assessment; Phase 3), the therapist activates the memory by asking the patient to bring to mind the most disturbing aspects of the first traumatic memory (i.e., target image) on which the treatment session will focus. The therapist assesses the associated self-referential dysfunctional belief (i.e., *negative cognition*; NC), an alternative desirable belief (i.e., *positive cognition*; PC), the associated key emotions and bodily sensations,

TABLE 1 The eight procedural steps of the eye movement desensitization and reprocessing (EMDR) standard protocol

Phase	Description of phase
Phase 1: Patient history and treatment planning	Gathering information about the patient's symptoms and history, formulating a case conceptualization, and developing a treatment plan.
Phase 2: Preparation	Preparing the patient for trauma work, including building a therapeutic alliance. Providing appropriate psychoeducation on the effects of exposure to traumatic events and EMDR therapy. Addressing the patient's emotional regulation skills and resources.
Phase 3: Assessment	Identifying the target memories on which the treatment sessions will focus. Activating the memory by asking the patient to bring to mind the most disturbing aspects of the traumatic memory image, the associated self-referential dysfunctional belief (i.e., negative cognition), an alternative desirable belief (i.e., positive cognition), and the associated key emotions and bodily sensations, then assessing the level of disturbance using a Likert-type subjective scale (range: 0–10).
Phase 4: Desensitization	Processing the target memories using a dual attention task that taxes the patient's working memory, typically rapid bilateral eye movements guided by the therapist's hand or by a "light bar," until no disturbance is reported.
Phase 5: Installation	Alongside the target memory, strengthening the alternative positive cognition that contradicts the negative cognition.
Phase 6: Body scan	Conducting a body scan in which the patient scans their body from head to toe, noting and releasing any remaining disturbing physical sensations related to the target memory in combination with the positive cognition.
Phase 7: Closure	Concluding the procedure, and making any necessary follow-up arrangements.
Phase 8: Reevaluation	Assessing the effectiveness of the previous treatment session and planning additional sessions based on this assessment.

and the subjective level of disturbance related to the target memory. This is indexed using a Likert-type Subjective Units of Disturbance scale (SUDS) ranging from 0 (*no disturbance*) to 10 (*extreme disturbance*).

Thereafter, the processing of the target memory starts with a dual-attention task, typically rapid bilateral eye movements guided by the therapist's hand (i.e., desensitization; Phase 4). After each set of eye movements, the therapist explores what spontaneously emerges for the patient, as the EMDR procedure typically elicits a flow of thoughts, images, emotions, and somatic sensations referred to as *associations*. The therapist then proceeds based on that response, encouraging the patient to "focus on that," and continue processing by following the therapist's fingers with their eyes. Typically, during the EMDR process, trauma memories gradually become "neutral" (i.e., lose their emotional charge) so that by the end of treatment, the patient should be able to recall the traumatic memory without experiencing any emotional disturbance (i.e., a score of 0 on the SUDS).

In the next step of the standard EMDR protocol (i.e., installation; Phase 5), the patient is asked to rate the credibility of the positive cognition on the Validity of Cognitions (VoC) scale, which ranges from 1 (*completely untrue*) to 7 (*completely true*). Subsequently, the patient is asked to recall the memory and repeat the positive cognition in

mind while simultaneously performing eye movements. These steps are repeated until the VoC is maximized.

A treatment session with EMDR generally ends with a "body scan" (Phase 6), after which agreements are made about the follow-up and whether the patient feels well enough to end the session (i.e., closure; Phase 7). The final phase of the standard EMDR protocol (i.e., reevaluation; Phase 8) occurs at the next meeting, where the therapist begins the session with a review of the previous session and assesses progress with regard to the effectiveness of what has been achieved so far. For a complete description of the treatment protocol, see Shapiro (2018).

A therapy session using EMDR in adults typically lasts 60–90 min and can be conducted individually or in a group format. Although randomized controlled studies are few and of low methodological quality, there is emerging evidence that group EMDR protocols can significantly reduce symptoms of PTSD (Kaptan et al., 2021). Although EMDR is usually administered in weekly sessions, condensed formats with daily or twice-daily sessions have also been found to be effective (Bongaerts et al., 2017). Individuals have been shown to no longer meet the diagnostic criteria for PTSD in as few as five treatment sessions following a single-incident traumatic event (e.g., Nijdam et al., 2012); in routine clinical practice and for PTSD arising from multiple traumatic events, longer protocols of eight to 12 sessions are typical.

CONCEPTUAL AND THEORETICAL FOUNDATIONS OF EMDR

Francine Shapiro (2018) developed the adaptive information processing (AIP) model as the theoretical basis for EMDR therapy. This model posits that highly distressing events can disrupt the emotional balance of the brain, resulting in the consolidation of memories along with associated cognitions, emotions, and physiological reactions, in a “frozen” state within isolated memory networks that can easily be activated by a wide variety of stimuli in everyday life. Additionally, the AIP model assumes that every individual has an innate information processing system that allows adaptive learning from new experiences. Under the influence of eye movements, like those observed during rapid eye movement (REM) sleep (Stickgold, 2002), stored traumatic experiences are believed to be released into the working memory for processing. In this sense, Shapiro’s AIP model suggests that EMDR facilitates the formation of new connections within an individual’s neural network, connecting the dysfunctional stored information with other existing networks of functional information and beliefs. The result of this process is the transformation of a traumatic memory into a more adaptive and functional form, leading to a cognitive restructuring of the traumatic experience and associated meanings and subsequent reduction in trauma-related symptoms. Hence, the AIP model primarily describes how the brain consolidates and processes dysfunctional information at the metaphorical level. A wide array of studies supports the basic tenets of the AIP model in that the desensitization of pathogenic memories is associated with symptoms of PTSD (Hase et al., 2017).

The first scientific research providing support for the AIP model and the role of eye movement in EMDR came from experimental research by Christman and colleagues (2003, 2006) via testing of their interhemispheric interaction hypothesis. The authors found that inducing horizontal eye movements increased the accessibility of episodic memories for both laboratory and everyday events. A later study by Parker and Dagnall (2007) showed that the effect of increased accessibility was stronger for horizontal eye movements than for both vertical eye movements and fixation on a specific point in the room. The authors suggest that this finding arose from the effect of an enhanced interaction between the two hemispheres of the brain, reflecting adaptive information processing; however, direct measurements of interhemispheric interaction using electroencephalography (i.e., EEG) data cast doubts on enhanced interhemispheric interaction as a neurobiological mechanism underlying EMDR (Samara et al., 2011).

Another theory, offering a potentially better explanation for the effects of EMDR, is derived from Baddeley’s (2012)

working memory model. The premise is that although working memory can perform multiple tasks simultaneously in different domains (e.g., verbal, visuospatial, problem-solving), each domain has a limited capacity. Performing a demanding task, therefore, potentially inhibits the performance of another task if this takes place within a similar working memory domain. Hence, when the visuospatial working memory store is “filled” by retrieving a traumatic memory, and a demanding, or taxing, visuospatial task is performed simultaneously—such as accurately tracking the therapist’s rapidly moving fingers with one’s eyes—it becomes difficult for the working memory to retain and process all this information at the same time. As a result, the intensity of recall of the traumatic memory is diminished due to the competition for working memory resources. Subsequently, when the memory signal is reconsolidated back into long-term memory, it is stored in a degraded, less emotional and vivid form.

Several predictions derived from the working memory taxation theory have been tested in experimental studies. Participants in these studies were asked to perform attention-demanding tasks while retrieving negative memories, only retrieving the memory, or doing nothing. After engaging in a demanding task with an emotionally laden memory in mind, these memories were significantly less emotionally laden and less vivid compared to the memories of participants in control conditions (de Jongh et al., 2013; Günter & Bodner, 2008; Kemps & Tiggemann, 2007; Maxfield, 2008; van den Hout et al., 2010). Although these studies have demonstrated that eye movements, particularly tracking the fingers of a therapist, are highly demanding tasks, the effects of several other working memory taxation tasks have also been tested, including listening to clicks through headphones (de Jongh et al., 2013; van den Hout et al., 2011), listening to orally presented text (Günter & Bodner, 2008), imitating a complex figure (Günter & Bodner, 2008), playing the computer game Tetris (Engelhard et al., 2011), mental arithmetic (Engelhard et al., 2010; van den Hout et al., 2010), and verbal counting (Kemps & Tiggemann, 2007). It is worth noting that not all working memory tasks have similar effects on memories. For example, eye movements have been found to be significantly more effective in reducing emotionality and the vividness of memories than listening to clicks through headphones (de Jongh et al., 2013; van den Hout et al., 2011, van den Hout & Engelhard, 2012). Conversely, whereas matching taxation tasks by modality to the recalled memory appears to have a larger effect, non-matched tasks also appear effective, potentially through taxing the central executive function of working memory (Matthijssen et al., 2019). Overall, there seems to be a linear association between the degree of working memory taxation (e.g., the speed of eye movements) and the reduc-

tion of emotional intensity and vividness of emotionally laden mental representations (Little & van Schie, 2019; van Veen et al., 2015). Although most experimental studies have involved nonclinical participants, these studies have been conducted and replicated by different research groups, providing strong scientific support for the observed memory effects in both healthy participants and PTSD samples (Wadji et al., 2022).

A novel version of EMDR that capitalizes on the scientific research into working memory theory and the effects of working memory–taxing tasks on traumatic memories has been termed “EMDR 2.0” (Matthijssen et al., 2021). This variant is based on the premise that EMDR is more effective and efficient when a patient is well-motivated to bring the traumatic memory into their working memory; the traumatic memory is more strongly activated; and the patient’s working memory is, thus, taxed more heavily. In the context of EMDR 2.0, many different procedures can be used to tax working memory, including superfast, diagonal, vertical, or other complex figures to track with eye movements; spelling words or sentences forward and backward or reciting the alphabet; singing a song; or tapping out complex rhythms on the shoulders or legs. The first experimental study on the efficacy of EMDR 2.0 taxation methods found no overall superior effect compared to the bilateral eye movements in traditional EMDR. Conversely, the finding that fewer sets were needed with EMDR 2.0 to achieve the same reductions in the emotionality and vividness of target memories supports the efficiency of the procedure (Matthijssen et al., 2021).

Interestingly, there is support from neurobiological research for the working memory theory as applied to EMDR. Taxing working memory has been shown to suppress the activity of the amygdala, the brain structure that acts as the brain’s “alarm bell” and plays a central role in the storage and reconsolidation of memories (de Voogd et al., 2018; Pierce & Black, 2023). This effect does not appear to be limited to eye movements; research has shown that any intervention that taxes a patient’s working memory can cause a weakening and desensitizing effect on emotionally laden memories (de Voogd & Phelps, 2020). There is also evidence of a dose-dependent effect such that the more working memory is taxed, the stronger the inhibition of the amygdala.

EMPIRICAL SUPPORT FOR EMDR FOR PTSD IN ADULTS

The efficacy of EMDR in adults diagnosed with PTSD has been established in over 30 published RCTs. To this end, individuals receiving EMDR have been compared with those in a waitlist control condition (Acarturk et al., 2016;

Högberg et al., 2007; Jensen, 1994; Marcus et al., 1997; Rothbaum, 1997; van den Berg et al., 2015) or a wide range of active control conditions, including relaxation training with and without biofeedback (e.g., Carletto et al., 2016; Carlson et al., 1998); imaginary rescripting (Alliger-Horn et al., 2015; Boterhoven de Haan et al., 2020); the counting method (Johnson & Lubin, 2006); forms of stabilizing interventions (ter Heide et al., 2016; van Vliet et al., 2021); and pharmacotherapy, such as fluoxetine (van der Kolk et al., 2007) and sertraline (Arnone et al., 2012). Most studies using an active comparison group have compared EMDR with a form of trauma-focused CBT, another first-line treatment for PTSD (e.g., de Jongh, Amann, et al., 2019). Overall, the results demonstrate large effect sizes for reductions of PTSD symptoms and significant decreases in the proportion of participants who meet the diagnostic criteria for PTSD after treatment, with remission rates ranging from 36% (Devilley & Spence, 1999) to over 90% (Capezzani et al., 2013; Nijdam et al., 2012).

Meta-analytic findings

In 2023, Yunitri et al. (2023) used network analysis to conduct a comprehensive meta-analysis of the effectiveness of various treatments for PTSD. This meta-analysis examined both the short-term and long-term effects of PTSD treatment. The researchers evaluated 18,897 studies published before March 2021 and ultimately analyzed 98 RCTs involving 5,567 participants, examining the results of PTSD interventions immediately following treatment and at a 6-month follow-up. The results indicated that EMDR and cognitive processing therapy (Resick et al., 2017) had the strongest effects on long-term outcomes, with moderate-to-large effect sizes and moderate heterogeneity. The authors reported no specific concerns regarding the risk of bias for EMDR studies. It is important to note that in recent years, some highly relevant controlled outcome studies have been published that were not included in the most recent meta-analyses (Boterhoven de Haan et al., 2020; van Vliet et al., 2021). One of these studies compared the effectiveness of EMDR therapy with imagery rescripting for childhood trauma among 155 participants who received up to 12 sessions, lasting 90 min each (Boterhoven de Haan et al., 2020). The treatment effects of EMDR between baseline and 1-year follow-up, as assessed using a clinician-administered interview, were very large ($d = 1.88$), with more than 80% of participants no longer meeting the diagnostic criteria for PTSD at that assessment. However, no differences between the two treatments at posttreatment and at 1-year follow-up were observed. In addition to the efficacy of EMDR as a treatment, there is some evidence for its relative efficiency and

cost-effectiveness. Estimates regarding the cost and benefits of treating individuals with PTSD provided by the U.K. National Health Service showed that EMDR was the most cost-effective intervention for adults with PTSD out of the 11 types of interventions assessed (Mavranzouli et al., 2020).

Effectiveness of EMDR in PTSD patients with comorbid presentations

As PTSD is highly comorbid with other psychiatric disorders, it is important to examine the effectiveness of the therapy in patients with comorbid mental health conditions. To this end, EMDR therapy has shown significant reductions in symptoms of anxiety and depression (Yunitri et al., 2020, 2023), low self-esteem, general psychological symptoms (Griffioen et al., 2017), and symptoms characteristic of borderline personality disorder (Wilhelmus et al., 2023). One of the most notable studies in this regard is an RCT that investigated the effectiveness of EMDR for PTSD in 155 participants diagnosed with schizophrenia or other psychotic disorders (van den Berg et al., 2015). After eight sessions of EMDR, 60% of the participants no longer met the diagnostic criteria for PTSD; these positive effects were maintained at 12-month follow-up (van den Berg et al., 2018). Interestingly, psychosis did not hinder the treatment, and the frequency of delusions also significantly decreased after treatment, with an average halving of the severity of these symptoms posttherapy (de Bont et al., 2016). Based on these findings, the authors concluded that individuals with psychosis should not be excluded from EMDR.

Status of EMDR in relation to complex PTSD

In 2012, a working group of the ISTSS published guidelines for the treatment of individuals with early childhood interpersonal trauma and symptoms of complex PTSD (CPTSD), basing them on the so-called phase-based treatment model (Cloitre et al., 2012; Herman, 1992). The choice for this model stems from the assumption that people who have experienced multiple and sustained interpersonal traumatic events, particularly during periods of development, lack the psychological stability to confront their traumatic memories in therapy and would, therefore, need a stabilization phase meant as a preparation for trauma processing (for a discussion, see de Jongh et al., 2016). Two studies tested the necessity of such a phased treatment approach by investigating the effectiveness of trauma-focused treatment in patients who met the criteria for a diagnosis of CPTSD per the *International Statisti-*

cal Classification of Diseases and Related Health Problems (11th rev.; *ICD-II*; WHO, 2019; van Vliet et al., 2021; Voorendonk et al., 2020). One study examined whether participants who met the diagnostic criteria for CPTSD would benefit from a short, intensive trauma-focused treatment for severe CPTSD without a prior stabilization phase involving skills training (Voorendonk et al., 2020, 2023). Participants were offered a residential trauma-focused treatment condensed into 8 days that combined exposure, EMDR, psychoeducation, and physical activity. Of 308 participants with PTSD, 66% met the *ICD-II* diagnostic criteria for CPTSD. Impressively, after 8 days of treatment, 88% of individuals classified as having CPTSD no longer met the diagnostic criteria. Although these results provided initial support for the notion that trauma-focused therapy is a safe treatment alternative for individuals with CPTSD, it is important to note the limitations of this study: The treatment program used an intensive format with various therapeutic components, treatments were conducted in an inpatient setting, the study lacked a control condition, and the authors did not examine the long-term effects of the treatment. To address these limitations, a follow-up RCT was conducted to examine the effectiveness of EMDR delivered with and without a stabilizing intervention in 121 adult participants with PTSD stemming from early childhood trauma who presented with symptoms of CPTSD. Treatment was delivered in an outpatient setting with 3- and 6-month follow-ups (van Vliet et al., 2021). The authors compared the effectiveness of 16 sessions of standalone EMDR to the same treatment preceded by eight sessions of a stabilization intervention (i.e., skills training in affect and interpersonal regulation [STAIR]; Cloitre et al., 2002). No differences in effects were observed between the two interventions when assessed immediately after treatment and at follow-up. Regardless of treatment condition, the severity and frequency of PTSD symptoms significantly decreased, and no differences in dropout rates or other negative side effects were found. At posttreatment, nearly 70% of participants no longer met the criteria for a PTSD diagnosis, and of the 29% of participants who had been diagnosed with CPTSD, only 3% still met the diagnostic criteria for this disorder. These results support the notion that CPTSD can be effectively treated with EMDR without a pretreatment phase in which patients are taught emotion regulation or other coping skills (de Jongh et al., 2016; de Jongh, Bicanic, et al., 2019).

CROSS-CULTURAL APPLICATIONS OF EMDR THERAPY

Minority ethnic groups and individuals from marginalized communities tend to be underrepresented in the EMDR outcome literature. Published studies usually report only

basic demographic characteristics and do not control for diversity characteristics. Reviews suggest that most EMDR trial participants, at least in studies conducted in the United States, are White, middle-class, heterosexual, educated, and verbal adults (Madnick & Spokas., 2022). When studies have focused on applications of EMDR for treatment in non-White participants, the therapy has often been delivered in a Westernized setting or the cohort sample size has been small (Wippich et al., 2023). Most studies also include participants with posttraumatic stress symptoms identified using self-report instruments rather than clinician-rated measures, and often, participants do not necessarily meet the full PTSD diagnostic criteria.

Despite this, EMDR is now widely used to treat post-traumatic stress symptoms in many Asian countries, including China, Japan, Thailand, and Cambodia. The EMDR Humanitarian Assistance Program has established projects in over 30 countries worldwide, including Afghanistan, Ukraine, Syria, Uganda, Palestine, and countries in Latin America, aimed at treating survivors of disasters and war and training local mental health professionals in providing EMDR (Gelbach, 2014). There is also a growing body of clinical practice guidance for culturally adapting EMDR to tackle the effects of minority stress, including chronic adversity, discrimination, and racial trauma (see Nickerson, 2022).

In Western contexts, controlled studies have found that EMDR can be effective in treating trauma-related conditions in diverse cultural and ethnic groups. For example, PTSD and depressive symptoms in Syrian and Iraqi refugees treated in Germany improved significantly after two group EMDR therapy sessions facilitated by Arabic-speaking interpreters (Lehning et al., 2017). An RCT of 72 refugee patients with a PTSD diagnosis seen in a specialist Dutch treatment center also found that a six-session course of EMDR was safe and effective in reducing PTSD symptoms among participants. Although most treatment completers achieved clinically significant improvements in clinician-rated PTSD symptoms, only four of 32 participants in the EMDR group no longer met the PTSD diagnostic criteria. Notably, the effect size was no better than a stabilization intervention and was less than the effect sizes for other trauma-focused therapies with comparable patients. The authors suggest this was because a six-session course was insufficient to process the multiple trauma memories driving PTSD symptoms in this population (ter Heide et al., 2016).

There are also promising results from studies in non-Western settings, including regions with high rates of trauma, such as conflict and disaster zones. In the largest study to date, 268 adults with low socioeconomic status living in Lebanon, including a small refugee cohort, were

treated with individual EMDR for symptoms stemming from a wide range of traumatic events. EMDR was found to be highly effective in reducing posttraumatic stress, depressive, and anxiety symptoms, and results were maintained at 6-month follow-up, although there was a 22% dropout rate (Wippich et al, 2023). The authors suggest this may have been a result of the fluidity and social instability of participants' circumstances.

EMDR has also shown promise in refugee populations living in contexts of displacement and ongoing threat. For example, 48 Eritrean adolescent refugees with clinically significant PTSD symptoms were treated in an Ethiopian refugee camp using six sessions of group-format EMDR delivered across 2 days, in the Tygrinian language, and supported by local refugee workers (Smyth-Dent et al., 2019). Treatment focused on the most distressing memories of the refugee experience itself, particularly trauma experienced during participants' journey to escape and the loss of contact with family and friends. Symptoms of depression, anxiety, and PTSD all improved significantly, and the time-condensed group format showed promise both for scaling up and for working in conditions in which individuals are in unstable circumstances and/or at imminent risk of sudden relocation or further traumatization. Similarly, an RCT conducted in a Syrian refugee camp that included a sample of 47 adult refugees with a chronic PTSD diagnosis found PTSD recovery rates of over 60% following two group EMDR sessions that took place over 3 days (Yurtsever et al., 2018).

DISCUSSION

A relatively large number of RCTs and meta-analyses on the effectiveness of EMDR demonstrating large effect sizes in treating PTSD symptoms, both in the short and long term, provide robust support for considering EMDR as a first-line treatment for PTSD. EMDR has also shown a significant impact on symptom clusters beyond PTSD, including symptoms characteristic of CPTSD, anxiety, depression, and psychosis.

Although EMDR seems to be as effective as other first-line treatments in the field, this therapeutic method may have potential advantages over other treatment methods, such as prolonged exposure therapy (Foa et al., 2007). Perhaps the most significant advantage is that patients are not required to explicitly disclose the exact details of a traumatic incident but rather instructed only to hold the traumatic memory in their working memory (i.e., "Just think about it"). Where there are cultural barriers to trauma disclosure (e.g., perceived stigma, a need for self-protection) existing EMDR adaptations, such as performing the procedure "blind to therapist"

(Farrell et al., 2020), mean that patients do not need to verbalize potentially shame-filled details of traumatic memories to process these memories with their EMDR therapist using dual-attention tasks. Conversely, there are certain categories of traumatic events for which scientific evidence related to EMDR is limited. Recently, a working group defined a number of promising target areas of research and goals for the future and concluded that there are six areas that warrant more research attention: PTSD in children and adolescents, early EMDR interventions, combat-related PTSD, unipolar depression, chronic pain, and cost-effectiveness studies (Matthijssen et al., 2020).

In addition, improvements could be made to the standard EMDR protocol, which has been minimally modified since its first version in 1994; for example, there is room for improvement in Phase 2, the preparation phase, in which the patient is asked to keep an imaginary safe place in mind. These and other interventions aimed at emotion regulation are at odds with studies clearly showing that if a trauma memory is well-activated, and the patient's general arousal level is increased, significantly better treatment effects can be expected (Littel et al., 2017; van den Hout et al., 2014). As with the stabilization phase prior to treatment (see previous section on CPTSD), these are arguments for removing emotion regulation-oriented elements from the standard protocol. More research endeavors also need to be directed toward improving the effectiveness and efficiency of the application of EMDR and its protocol (e.g., the importance of maximizing working memory taxation; Matthijssen et al., 2021).

Challenges may arise in implementing EMDR in diverse cultural contexts, including language barriers, stigma associated with mental health, and differences in symptom expression. For example, Seponski (2011) explored the use of EMDR among Cambodian patients and therapists and concluded that although research findings were often positive regarding the treatment's effectiveness, there was broad agreement that standard EMDR was not an "easy fit" with this population. Because no studies to date have compared the effectiveness of a standard versus adapted EMDR protocol for a particular population, there is currently no empirical basis to guide when or how to culturally adapt EMDR. More rigorously designed outcome studies that focus on individuals with a PTSD diagnosis and utilize clinician-rated measures within various populations would be helpful.

In conclusion, EMDR is rightfully recognized as an evidence-based intervention for PTSD given the substantial evidence to support its efficacy and effectiveness. Although rigorous studies evaluating the beneficial effects of EMDR are still needed in certain areas, the existing evidence clearly support its use as a first-line treatment for PTSD.

AUTHOR NOTE

Ad de Jongh and Carlijn de Roos receive income from published books on eye movement desensitization and reprocessing therapy and for the training of postdoctoral professionals in this method.

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